UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,783	03/29/2007	Thomas Wahl	10191/4729	5500

26646 7590 02/03/2010

KENYON & KENYON LLP
ONE BROADWAY
NEW YORK, NY 10004

EXAMINER	
TRAN, THIEN S	

ART UNIT	PAPER NUMBER
3742	

MAIL DATE	DELIVERY MODE
02/03/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/581,783	WAHL ET AL.	
	Examiner	Art Unit	
	THIEN TRAN	3742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 November 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *20 and 22-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *20 and 22-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 20, 22, 27-29 and 31-38 are rejected under 35 U.S.C. 102(b) as being anticipated by Noda (US Patent 6,169,275).

3. Regarding claim 20, Noda teaches a ceramic laminate (Col 2, Lines 16-19), comprising: at least one solid electrolyte layer (Col 6, Lines 17-20); at least one insulation layer (Fig 4, Item 1a & b, Ceramic substrate, Col 8, Lines 2-6) provided on the at least one solid electrolyte layer; an electrical resistor track (Fig 4, Item 21, Heat generating portion, Col 8, Lines 7-9) extending in a meandering configuration and connected to two electrical lead tracks (Fig 4, Item 23a & b, Lead portions, Col 8, Line 10) wherein the electrical resistor track and the two electrical lead tracks are embedded in the at least one insulation layer (Col 8, Lines 3-6), and wherein the resistor track includes a material having a greater specific Ohmic resistance compared to a material of the two lead tracks (Col 3, Lines 34-39), wherein the specific Ohmic resistance of the material of the resistor track is at least twice as great as the specific Ohmic resistance of the material of the two lead tracks (Col 3, Lines 16-20), and wherein the resistor track has a width that is maximum possible width defined as a function of a width of the at least one insulation layer, and wherein the resistor track has a thickness that is at least

an order of magnitude smaller than the width of the resistor track (Fig 4, Items 21, 23a & 23b).

4. Examiner interprets that Noda teaches "where the specific Ohmic resistance of the material of the resistor track is at least twice as great as the specific Ohmic resistance of the material of the two lead tracks" because if the electrical resistance of the resistor track (Fig 4, Item 21, Heat generating portion, Col 8, Lines 7-9) is at 95% (Col 3, Lines 16-20), then the remaining 5% is left for the two electrical lead tracks (Fig 4, Item 23a & b, Lead portions, Col 8, Line 10). The 95% resistance of the heat generating portion of Noda is at least twice as great as the specific Ohmic resistance of the material of the two lead tracks which is 5% and therefore meets the limitation of claim 1.

5. Regarding claim 22, Noda teaches where a temperature coefficient of the material of the resistor track (Heat generating portion, Col 4, Lines 55-60 & Col 5, Lines 34-36) is less than a temperature coefficient of the material of the two lead tracks (Col 5, Lines 34-36, Lead portion). Examiner interprets that because the resistor track (Heat generating portion) of Noda is made of tungsten and rhenium and the lead tracks (Lead portion) are made from tungsten and molybdenum, the temperature coefficient of the resistor track is less than the lead tracks. It is well known in the art that rhenium has a lower temperature coefficient than molybdenum.

6. Regarding claim 27, Noda teaches where the resistor track includes a high Ohmic platinum paste (Col 2, Lines 50-53).

7. Regarding claim 28, Noda teaches where the high Ohmic platinum paste has an aluminum oxide support content of approximately 30% (Col 4, Lines 48-51). It is well known in the art that alumina is equivalent to aluminum oxide.

8. Regarding claim 29, Noda teaches where the thickness of the resistor track is at least 5 μm (Col 8, Lines 59-63). Examiner interprets that 25 μm is at least 5 μm.

9. Regarding claim 31, Noda teaches where the resistor track has three meandering turns resulting in four meander legs which extend parallel to one another, and where two interior meander legs are locally widened in width (Fig 4, Item 21, Heat generating portion).

10. Regarding claim 32, Noda teaches where the two lead tracks (Fig 4, Item 23a & b, Col 5, Lines 40-41) include low Ohmic platinum paste (Col 5, Lines 40-47). As disclose by Noda, the heat generating portion and the lead portion constitute the heat generating resistor (Col 5, Lines 40-41).

11. Regarding claim 33, Noda teaches where the low Ohmic platinum paste has an aluminum oxide support content of approximately 5% (Col 4, Lines 48-51). It is well known in the art that alumina is equivalent to aluminum oxide.

12. Regarding claim 34, Noda teaches where the thickness of resistor track and the thickness of the two lead tracks are substantially equal (Col 8, Lines 59-63).

13. Regarding claim 35, Noda teaches where at least one insulation layer includes a first insulating layer (Fig 4, Item 1b, Ceramic substrate, Col 8, Lines 2-4) and a second insulating layer (Fig 4, Item 1a, Ceramic substrate, Col 8, Lines 2-4), the first insulating layer being applied onto the solid electrolyte layer (Col 6, Lines 17-20), and wherein the

resistor track (Fig 4, Item 2, Heat generating resistor, Col 8, Lines 4-5) is situated on the first insulating layer, and wherein that second insulating layer covers the resistor track (Fig 4, Item 2 is between Item 23a and 23b).

14. Regarding claim 36, Noda teaches where the first insulating layer (Fig 4, Item 1b, Ceramic substrate, Col 8, Lines 2-4) coats the at least one solid electrolyte layer (Col 6, Lines 17-20), the resistor track (Fig 4, Item 2, Heat generating resistor, Col 8, Lines 4-5) and the two lead tracks are printed (Col 2, Lines 50-54) onto the first insulating layer (Fig 4, Item 1b, Ceramic substrate, Col 8, Lines 2-4) and the second insulating layer (Fig 4, Item 1a, Ceramic substrate, Col 8, Lines 2-4) covers the resistor track and the two lead tracks (Fig 4, Item 2 is between Item 23a and 23b). Examiner interprets that methods (vapor deposition or sputter coating) of coating the first insulating layer over the solid electrolyte layer are well known in the art.

15. Regarding claim 37, Noda teaches where the laminate is configured as an electrical heater in a sensor element for measuring an oxygen concentration in an exhaust gas of an internal combustion engine (Abstract, Lines 13-17, Ceramic heater used in an oxygen sensor), and wherein the sensor element is connected to a side of the resistor track (Fig 4, Item 21, Heat generating portion, Col 8, Lines 7-9) embedded in the at least one insulation layer (Fig 4, Item 1a & b, Ceramic substrate, Col 8, Lines 2-6) and facing away from the at least one solid electrolyte layer (Col 6, Lines 17-20). It is well known in the art that oxygen sensors oxygen concentration in an exhaust gas of an internal combustion engine.

16. Regarding claim 38, Noda teaches where the laminate is configured as a temperature sensor for measuring a temperature of an exhaust gas of an internal combustion engine (Abstract, Lines 13-17, Ceramic heater used in an oxygen sensor).

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

18. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

19. Claims 23-26, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noda (US Patent 6,169,275) as applied to claims 20-22, 27-29 and 31-38, in view of Murase (US Patent 4,883,947).

20. Regarding claim 23, Noda does not teach where the width of the resistor track is greater than the width of each of the two lead tracks. In analogous art of resistance ceramic heater, Murase discloses where the width of the resistor track (Fig 3(e), Item 6, Heat-generating portion, Col 7, Lines 65-67) is greater than the width of each of the two

lead tracks (Fig 3(e), Item 8, Electrical Leads, Col 8, Line 1) for the benefit of assuring even distribution of heating temperature, improved heating efficiency, and increased resistance to thermal stresses (Col 2, Lines 36-42). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Noda with the disclosure of Murase for the benefit of assuring even distribution of heating temperature, improved heating efficiency, and increased resistance to thermal stresses.

21. Regarding claim 24, as applied to claims 20-23, Noda does not teach where the width of the resistor track is at least 50% greater than the width of each of the two lead tracks. In analogous art of resistance ceramic heater, Murase discloses where the width of the resistor track (Fig 3(e), Item 6, Heat-generating portion, Col 7, Lines 65-67) is at least 50% greater than the width of each of the two lead tracks (Fig 3(e), Item 8, Electrical Leads, Col 8, Line 1) for the benefit of assuring even distribution of heating temperature, improved heating efficiency, and increased resistance to thermal stresses (Col 2, Lines 36-42). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Noda with the disclosure of Murase for the benefit of assuring even distribution of heating temperature, improved heating efficiency, and increased resistance to thermal stresses.

22. Regarding claim 25, Noda teaches where the width of the resistor track is dimensioned greater than 500 μm (Col 12, Lines 9-12). Examiner interprets that the resistor track (Heat generating portion) of Noda is greater than 500 μm (650 μm), 0.65 mm is equal to 650 μm.

23. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Noda (US Patent 6,169,275) as applied to claims 20-22, 27-29 and 31-38, in view of Murase (US Patent 4,883,947) and further in view of Okuda (US Patent 5,750,958).

24. Regarding claim 26, Noda in view of Murase does not teach where the thickness of the resistor track is less than 14 μm. In analogous art of ceramic glow plug, Okuda discloses where the thickness of the resistor track is less than 14 μm (Fig 1 & 2, Items 3 & 4, Col 6, Lines 60-67 & Col 7, Lines 1-3) for the benefit of preventing cracks or any other problems in the layers of the heating resistor (Col 7, Lines 1-4). It would have been obvious to combine the teachings of Noda and Murase with the disclosure of Okuda for the benefit of preventing cracks or any other problems in the layers of the heating resistor.

25. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Noda (US Patent 6,169,275) as applied to claims 20-22, 27-29 and 31-38, in view of Okuda (US Patent 5,750,958).

26. Regarding claim 30, Noda teaches where the high Ohmic platinum paste contains nanoplatinum (Col 5, Lines 46-51). Noda does not teach where the thickness of the resistor track is dimensioned at less than 5 μm. In analogous art of ceramic glow plug, Okuda discloses where the thickness of the resistor track is dimensioned at less than 5 μm (Fig 1 & 2, Items 3 & 4, Col 6, Lines 60-67 & Col 7, Lines 1-3) for the benefit of preventing cracks or any other problems in the layers of the heating resistor (Col 7, Lines 1-4). It would have been obvious to combine the teachings of Noda with the

disclosure of Okuda for the benefit of preventing cracks or any other problems in the layers of the heating resistor.

Response to Amendment

21. Claim 20 has been amended.

22. Claim 21 has been cancelled.

23. Claims 20, 22-38 are pending.

Response to Arguments

24. Applicant's arguments filed 11/05/2009 have been fully considered but they are not persuasive.

25. Regarding the Remarks concerning amended claim 1 (Arguments, Pg 5, Paragraph 7), "Noda does not disclose the feature that the specific Ohmic resistance of the material of the resistor track is at least twice as great as the specific Ohmic resistance of the material of the material of the two lead tracks". The examiner disagrees because as defined by the applicant, specific Ohmic resistance is electrical resistivity (Arguments, Pg 6, Paragraph 1). Further, Noda teaches where "the specific Ohmic resistance of the material of the resistor track is at least twice as great as the specific Ohmic resistance of the material of the material of the two lead tracks" on Col 3, Lines 34-39. If the electrical resistance of the resistor track (Fig 4, Item 21, Heat generating portion, Col 8, Lines 7-9) is at 95% (Col 3, Lines 16-20), then the remaining 5% is left for the two electrical lead tracks (Fig 4, Item 23a & b, Lead portions, Col 8,

Line 10). The 95% resistance of the heat generating portion of Noda is at least twice as great as the specific Ohmic resistance of the material of the two lead tracks which is 5% and therefore meets the limitation of claim 1.

26. Regarding the Remarks concerning amended claim 1 (Arguments, Pg 6, Paragraph 1 & 2), "Noda not disclosing modifying the specific Ohmic resistance by choice of material". The examiner disagrees because Noda discloses controlling the electrical resistance of the resistor track and lead tracks by controlling the material type on Col 5, Lines 25-39.

27. Regarding the Remarks concerning claims 20, 22-38 and the combination of Noda, Murase and Okuda, the combinations are appropriate because they are in the same field of endeavor and justified by the following case law.

> When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. Id. at, 82 USPQ2d at 1396.

The U.S. Supreme Court supplied seven rationales in *KSR International* **v.** *Teleflex Inc.* (550 USPQ2d 1385) that, by following the factual inquiries set forth in *Graham* **v.** *John Deere Co.* (383 U.S. 1, 148 USPQ 459 (1966)), establish a prima facie case of obviousness. The rationales are:

> (a) Combining prior art elements according to known methods to yield predictable results;
> (b) Simple substitution of one known element for another to obtain predictable results;
> (c) Use of a known technique to improve similar devices, methods, or products in the same way;
> (d) Applying a known technique to a known device, method, or product ready for improvement to yield predictable results;
> (e) "Obvious to try" - choosing from a finite number of identified, predictable solutions, with a reasonable expectation of sucess;

(f) Known work in one field of endeavor may prompt variations of it for us in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art;
(g) Some teaching, suggestion, or motivation to combine prior art references that would have led one of ordinary skill to modify the prior reference teachings to arrive at the claimed invention.

The Examiner notes that above rationales are merely exemplary. For more information, see MPEP § 2141.

Conclusion

28. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

29. Any inquiry concerning this communication or earlier communications from the examiner should be directed to THIEN TRAN whose telephone number is (571)270-7745. The examiner can normally be reached on Mon-Thurs, 8-5PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tu Hoang can be reached on 571-272-4780. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/THIEN TRAN/
Examiner, Art Unit 3742
/TU B HOANG/

Supervisory Patent Examiner, Art Unit 3742